

Phet Simulations - WAVE Related

EARLS' ANSWERS

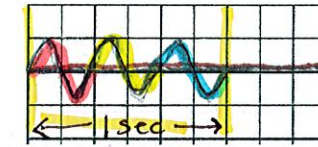
http://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html

Set up the simulation in the following way, then press play and answer the questions.

- ✓ Oscillate
- ✓ No End
- ✓ No damping
- ✓ High tension
- ✓ Slow Motion

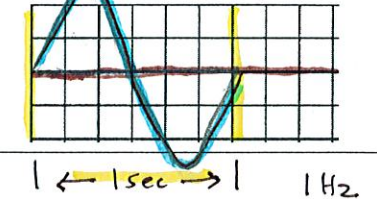
1. Draw this wave in the box:

- ✓ Amplitude = 0.5 cm
- ✓ Frequency = 3.0 Hz



2. Draw this wave in the box:

- ✓ Amplitude = 1.25 cm
- ✓ Frequency = 1.0 Hz



3. What happens to the wave when the amplitude is increased?

Crests get higher; troughs get lower

4. What happens to the wave when the frequency is increased?

more waves per second; wavelengths (λ) get shorter

5. Describe two other things you learn about waves from this simulation.

When there is ~~no~~ damping, the energy does not diminish through the wave

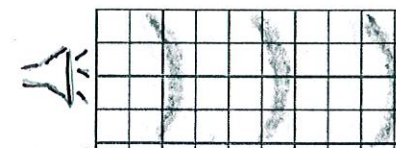
<http://phet.colorado.edu/en/simulation/legacy/wave-interference>

tension is how tightly the atoms are spaced.

Set up the simulation in the following way, then press play and answer the questions.

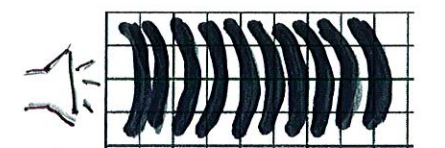
- ✓ SOUND TAB
- ✓ Show the graph
- ✓ Grayscale

6. Draw the Compression/Longitudinal wave with low frequency and low amplitude



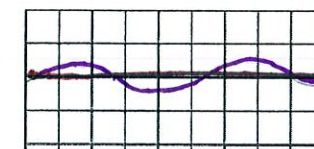
- light gray
- not bold
- few lines
- few compressions

7. Draw the Compression/Longitudinal wave with high frequency and high amplitude

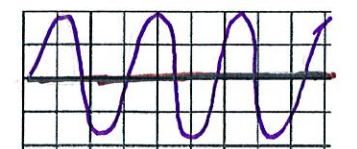


- bold, dark lines
- many compressions

8. Draw the Transverse Wave with low frequency and low amplitude



9. Draw the Transverse wave with high frequency and high amplitude



10. If in class, use earbuds and turn the **sound on**. Describe what happens to the sound when you:

- Increase the frequency- higher pitch
- Decrease the frequency- lower pitch
- Increase the amplitude- louder sound
- Decrease the amplitude- softer sound

11. Click on the **Particle Button** which shows atoms marked with a red X. Describe how the individual atoms in a sound wave behave and describe whether they move with the energy. Individual particles move back to their original position but transfer energy to next atom.

12. Set the frequency on about 0.25 and the amplitude on 1.0 with the **particle button on**. Press play and then pause it. Draw the sound wave below and label the compressions and rarefactions.

